II.   <u>AMENDMENTS TO THE CLAIMS</u>

- *<u>PLEASE FIND BELOW A MARKED VERSION OF CLAIMS WITH PRESENT
  STATUS DELINEATED</u>*

  - *<u>THE CLAIMS ARE HEREIN AMENDED, CANCELED, OR ADDED TO, SO AS
    TO EVENTUATE IN THE NEW SET OF PENDING CLAIMS INDICATED
    BELOW. THIS LISTING OF CLAIMS WILL REPLACE ALL PRIOR VERSIONS
    AND LISTING OF CLAIMS IN THE APPLICATION.</u>*

Claims are shown on next page.

1.-39. (CANCELLED)

40.   (CURRENTLY AMENDED) The method of claim [[47]] <u>48</u>, wherein the
~~digitized color image~~ signal is derived through a computer-aligned plurality of
microscope objectives from a large field sample.

41.   (CURRENTLY AMENDED) The method of claim [[47]] <u>48</u> , wherein the rare
cell is present at a concentration of 0.001%, 0.0001%, 0.00001%, or 0.000001%.

42. – 44. (CANCELLED)

45.   (CURRENTLY AMENDED) A computer software product for use in a
computerized microscopic vision system comprising a computer-readable storage medium
containing a sequence of computer-directed steps to identify automatically a rare cell
image, in accordance with <u>method of</u> claim 4<u>8</u>[[7]].

46.   (CANCELLED)

47. (CURRENTLY AMENDED) A ~~computer-controlled~~ method for ~~automated~~ rare cell
<u>bright field and fluorescence</u> microscopic image <u>detection and</u> identification, comprising
the <u>automatic motorized</u> steps ~~of instructions~~ of:
(i) <u>locating and digitizing a bright field and fluorescence microscopic</u> image <u>of a rare cell</u>
<u>candidate or a cell blob containing a rare cell candidate with</u> ~~starting~~ a microscope
objective ~~from a position at a point of origin (x₁,y₁) of an optical field to locate and~~
~~digitize a native or stained color image of a rare cell candidate or a cell blob containing a~~

~~rare cell candidate,~~ and digitally record and store x and y coordinates as well as focal y-z

coordinates thereof, <u>starting</u> <u>from, and relating to, a position at a point of origin (x₁,y₁) of</u>

<u>an optical field</u>;

(ii) <u>detecting</u> ~~measuring~~ <u>by</u> pre-set criteria [[of]] <u>according to</u> <u>cell size, cell morphology,</u>

<u>and characteristic cell markers</u> [[of]] the digitized image of a rare cell <u>candidate, or a cell</u>

<u>blob containing a rare cell candidate,</u> or rare cell <u>candidate</u> nucleus, ~~in terms of size,~~

~~morphology, and characteristic cell markers, while~~

(iii) ~~enhancing detection of said rare cell color image signal by applying a computer-stored~~

~~signal mask with limiting pixel values,~~ identifying said detected rare cell <u>candidate image</u>

<u>by locating with a sensor</u> a <u>motorized and</u> computer-controlled <u>tagging or labeling</u> reagent

dispensing system ~~by using the automatically recorded coordinates of said rare cell~~ over

said rare cell <u>candidate</u> image according to the x, y and y-z position coordinates ~~a~~

~~computer controlled reagent dispensing system programmed~~ to apply <u>automatically and</u>

selectively <u>one or more</u> [[a]] specific tag or label to said rare cell <u>candidate</u> image *in situ* .

48.   **(NEW)** A method for detecting a cell deposited on a microscope slide and labeled

with a detectable label performed using a computerized microscope system having a stage

for holding said microscope slide, a microscopic vision module for detecting a signal

indicative of the presence of a labeled rare cell, or a blob comprising a labeled rare cell, on

the microscope slide and for recording the position coordinates of said rare cell, or said

blob comprising said labeled rare cell in an optical field, a processor configured, based on

data pertaining to the position coordinates of said rare cell or said blob comprising said

labeled rare cell, to provide instructions to locate a reagent dispenser at the position

coordinates of a signal indicative of the presence of said labeled rare cell, or said blob

comprising a labeled rare cell, and to cause said reagent dispenser to dispense a volume of

material, said method comprising the steps of:

(i) automatically locating in an optical field a rare cell candidate, or a cell blob

comprising a rare cell candidate, by determining correspondence of digitized optical

properties in an optical field with predetermined data indicative of said labeled rare cell;

(ii) automatically recording coordinates of said rare cell candidate, or said blob

comprising said labeled rare cell, in the optical field;

(iii) automatically locating said reagent dispenser over said rare cell candidate, or

cell blob comprising a rare cell candidate, based on one or more set of said position

coordinates; and

(iv) automatically dispensing reagent from said reagent dispenser onto said rare

cell candidate, or said blob comprising said rare cell candidate.

49.   **(NEW)** The method of claim 48 wherein said reagent dispensed at step (iv) is at

least one material selected from the group consisting of: a label, PCR material, and a

primer.

50.   **(NEW)** The method of claim 48 wherein said reagent dispenser of said

computerized microscope is interfaced with a motor such that it can move with respect to

said stage.

51.   **(NEW)** The method of claim 48 wherein said stage of said computerized

microscope is motorized to move with respect to such reagent dispenser.

52.   **(NEW)** The method of claim 48 further comprising after step (iv), a step (v) comprising moving said slide to a thermocycling station.

53.   **(NEW)** The method of claim 48 wherein the reagent dispenser of said computerized microscope comprises a sensor for locating position with respect to said microscope slide or microscope stage.

53.   **(NEW)** The method of claim 48 wherein the reagent dispenser of said computerized microscope comprises a pump for delivering reagents from a reagent reservoir.